CLAIMS

1. A method for controlling transmissions on an uplink in a communication system, comprising:

determining one or more characteristics of the communication system;

partitioning available system resources into a plurality of channels;

defining a plurality of back-off factors for the plurality of channels based at least in part on the one or more determined characteristics of the communication system, wherein each channel is associated with a respective back-off factor that identifies a reduction from peak transmit power level, and wherein each back-off factor ranges from zero to one; and

assigning the plurality of channels to terminals for data transmission at power levels determined based at least in part on the plurality of back-off factors.

2. The method of claim 1, wherein the one or more determined characteristics include characterization of interference on the plurality of channels.

3. The method of claim 1, wherein the one or more determined characteristics include loading probabilities for the communication system.

4. The method of claim 1, wherein the plurality of back-off factors are defined to approximately match the one or more determined characteristics of the communication system.

5. The method of claim 1, wherein the plurality of back-off factors are defined to approximately match C/I characterization of terminals in the communication system.

6. The method of claim 1, wherein the plurality of back-off factors are defined based in part on one or more setpoints selected for the plurality of channels, wherein each setpoint corresponds to a C/I required for a particular level of performance.

7. The method of claim 6, wherein the one or more setpoints are determined based in part on data rates of data transmissions on the plurality of channels.

8. The method of claim 1, further comprising:

estimating a link margin for each channel;

adjusting the plurality of back-off factors based on the estimated link margin.

9. The method of claim 1, wherein at least one channel is associated with a back-off factor of one, representative of full transmit power, and remaining channels are associated with back-off factors of less than one.

10. The method of claim 1, further comprising:

adaptively adjusting the plurality of back-off factors to reflect changes in the communication system.

11. The method of claim 1, further comprising:

reducing one or more back-off factors for a particular time duration to reduce interference on the associated channels.

12. The method of claim 1, further comprising:

setting one or more back-off factors to zero for a particular time duration to eliminate interference on one or more associated channels.

13. The method of claim 1, wherein the available system resources are partitioned into a plurality of time division multiplexed (TDM) time slots, and wherein the plurality of channels correspond to defined sets of time slots.

14. The method of claim 1, wherein the available system resources are partitioned into a plurality of frequency division multiplexed (FDM) channels.

15. The method of claim 1, wherein the available system resources are partitioned into a plurality of code division multiplexed (CDM) channels.

16. A method for controlling transmissions on an uplink in a communication system, comprising:

defining a reuse pattern for the communication system, wherein the reuse pattern includes a plurality of cells;

determining one or more characteristics for each cell in the communication system;

partitioning available system resources into a plurality of channels;

defining a plurality of back-off factors for the plurality of channels for each cell in the communication system based at least in part on the determined one or more characteristics, wherein each channel of each cell is associated with a respective back-off factor that identifies a reduction from peak transmit power level, and wherein each back-off factor ranges from zero to one; and

assigning the plurality of channels in each cell to terminals within the cell for data transmission at power levels determined based at least in part on the back-off factors associated with the assigned channels.

17. The method of claim 16, wherein the one or more determined characteristics for each cell include characterization of interference on the plurality of channels in the cell.

18. The method of claim 17, wherein the plurality of back-off factors for each cell are defined based in part on the interference characterization for the cell.

19. The method of claim 16, wherein the back-off factors for each cell in the reuse pattern are approximately staggered from those of neighboring cells in the reuse pattern.

20. The method of claim 16, further comprising:

adjusting the back-off factors assigned to the channel in each cell to reduce co-channel interference.

21. The method of claim 16, further comprising:

estimating link margins for the channels in each cell; and

adjusting the back-off factors for each cell based on the estimated link margins.

22. The method of claim 16, further comprising:

at a particular cell, receiving one or more requests from one or more neighbor cells to reduce the back-off factor for a particular channel; and

reducing the back-off factor for the channel in accordance with the one or more received requests.

23. A method for operating an uplink of a wireless communication system, comprising:

partitioning available system resources into a plurality of channels;

defining a reuse pattern for the communication system, wherein the reuse pattern includes a plurality of cells;

determining one or more characteristics for each cell in the communication system;

allocating a set of channels to each cell based at least in part on the determined one or more characteristics for the cell, wherein each allocated channel may be assigned to a terminal for data transmission on the uplink; and

repeating the determining and allocating to reflect changes in the communication system.

24. The method of claim 23, wherein each cell in the reuse pattern is allocated a respective set of channels that includes one or more channels available for transmission at full power level and one or more channels available for transmission at reduced power levels.

25. The method of claim 23, wherein the set of channels allocated to each cell is determined based in part on estimated loading conditions in the cell.

26. A method for operating an uplink in a communication system, comprising:

defining a reuse scheme to be used for data transmission by a plurality of terminals, wherein the defined reuse scheme identifies a particular reuse pattern, an initial allocation of available system resources, and a set of operating parameters;

scheduling terminals for data transmission in accordance with the defined reuse scheme;

receiving transmission from scheduled terminals;

evaluating performance of the communication system;

determining whether the evaluated system performance is within particular thresholds; and

if the evaluated system performance is not within the particular thresholds, redefining the reuse scheme.

27. The method of claim 26, wherein the defining the reuse scheme includes developing characterization of interference received at each cell in the communication system,

partitioning the available system resources into a plurality of channels, and

allocating a set of channels to each cell based at least in part on the developed interference characterization for the cell.

28. The method of claim 27, wherein the defining the reuse scheme further includes

defining a set of back-off factors to be associated with each allocated set of channels.

29. A method for scheduling a plurality of terminals for data transmission on an uplink in a communication system, comprising:

receiving a first set of parameters to be used for scheduling terminals for data transmissions;

prioritizing terminals to be considered for scheduling;

scheduling one or more terminals for data transmission based at least in part on the priority of the terminals;

assigning a channel to each scheduled terminal;

updating a second set of parameters used for controlling transmissions by the scheduled terminals; and

receiving one or more transmissions from the one or more scheduled terminals on the assigned channels.

30. The method of claim 29, wherein the first set of parameters includes interference characterization of each cell.

31. The method of claim 29, wherein each scheduled terminal is assigned a channel based on the priority of the terminal.

32. The method of claim 29, wherein each scheduled terminal is assigned a channel based on load requirements of the terminal.

33. A method for scheduling a plurality of terminal for data transmission on an uplink in a communication system, comprising:

prioritizing terminals to be considered for scheduling;

computing a channel metric for each of a plurality of channels for each terminal;

assigning the terminals to the channels based on priorities of the terminals and the computed channel metric, wherein the assigning includes

selecting a terminal having a highest priority,

assigning the selected terminal to a channel having a least favorable channel metric but meeting requirements of the terminal, and

successively assigning remaining terminals, in order of decreasing priority, to remaining unassigned channels; and

receiving transmissions from the scheduled terminals on the assigned channels.

34. The method of claim 33, the assigning the terminals further includes

upgrading one or more terminals to unassigned channels having more favorable channel metric.

35. The method of claim 34, wherein the upgrading includes

selecting a terminal having a highest priority;

selecting a channel, from a list of unassigned channels, having a most favorable channel metric; and

reassigning the selected terminal to the selected channel if the channel metric associated with the selected channel is more favorable than the channel metric associated with the channel currently assigned to the selected terminal.

36. A base station in a communication system, comprising:

a resource allocation processor configured to receive data defining a reuse plan to be used for uplink data transmissions by a plurality of terminals, wherein the defined reuse plan identifies a particular reuse pattern, an allocation of available system resources to a cell covered by the base station, and a set of operating parameters,

wherein the resource allocation processor is further configured to schedule one or more terminals for data transmission and to assign a channel to each scheduled terminal;

at least one front-end processor configured to process one or more received signals from the one or more scheduled terminals to provide one or more received symbol streams; and

at least one receive processor configured to process the one or more received symbol streams to provide one or more decoded data streams and to estimate one or more characteristics for the cell,

wherein the resource allocation processor is further configured to receive channel state information (CSI) indicative of the one or more characteristics and to schedule terminals and assign channels based on the CSI.

37. The base station of claim 36, wherein the allocated system resources comprise a plurality of channels, and wherein the resource allocation processor is further configured to determine a plurality of back-off factors for the plurality of channels based at least in part on the CSI.